

DOCKETED

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Proposed Changes to the New Solar Homes Partnership (NSHP) Guidebook

Renewable Energy Division

California Energy Commission

Charles Imbrecht Hearing Room

January 6, 2017

Presenters: Elizabeth Hutchison and Joseph Omoletski



Agenda

- 9:00 Welcome & Housekeeping
- 9:15 Proposed Changes to the NSHP Guidebook
- 10:00 Break
- 10:15 Questions/Public Comment



NSHP Program Goals

- Sustainable solar homes market; builder commitment to install solar energy systems
- High-performing solar systems on highly efficient residential construction
- Achieve 360 megawatts of installed solar electric capacity in California
- Solar on 50%+ of new homes
- Self-sufficient solar industry



Photo Courtesy of Sherrill Neidich



Proposed Changes Aim to:

- Respond to CPUC Final Decision approved on June 9, 2016
- Address 2016 Building Standards (effective January 1, 2017)
- Streamline application process and increase program participation



Proposed Changes to the NSHP Guidebook

Incentive Levels

- Ends incentive level decline at step 8 for both Market-Rate and Affordable Housing projects

MARKET

Level	Code-Compliant Incentive* (per watt, reference system)	Tier I Incentive** (per watt, reference system)	Tier II Incentive** (per watt, reference system)
6	\$1.00	\$1.25	\$1.50/\$1.75****
7	\$0.75	\$1.00	\$1.50
8	\$0.50	\$0.75	\$1.25

AFFORDABLE

Level	Dwelling Unit Code-Compliant and Common Area Incentive* (per watt, reference system)	Tier I and Tier II Dwelling Unit Incentive** (per watt, reference system)
6	\$1.50	\$1.85
7	\$1.40	\$1.75
8	\$1.30	\$1.65



Proposed Changes

Energy Efficiency

- Code-compliant is the only efficiency tier available for 2016 Standards projects
- If a PV system is used for compliance under the 2016 Standards, only the portion of the system that exceeds the size required to claim the Title 24 PV compliance credit can be eligible for incentives.
- Compliance size calculations:
 - “One size fits most” approach for single family homes under 2500 SF
 - Detailed calculation for homes greater than 2500 SF and low-rise multifamily projects



Proposed Changes

Energy Efficiency continued

- Removes 30% space cooling requirement for 2013 Tier II projects
- Restricts 2013 common area projects to code-compliant incentive level only, and 2008 common area projects to Tier 1 incentive level only.
- Require 2013 high-rise multifamily projects to have CF-1R signed by a nonresidential CEA
- Allows code-compliant projects to provide proof of EE verification through either COO or completion of CF-3Rs



Proposed Changes

PV System Eligibility

- Limits eligibility to systems installed with azimuths between 90 degrees and 280 degrees.
- Capacity outside of the eligible azimuth range can be counted toward solar compliance size
- Increases the solar permit application time from 60 days to 120 days after the issuance date of a certificate of occupancy



Proposed Changes

Incentive Calculation

- Uses the Flexible Installation (FI) calculator to determine project incentive (**Demonstration will follow presentation**)
- Discontinues CECPV calculator



Proposed Changes

PV System Verification

- Increases allowed third party verification sample group size to 1 in 15
- Changes from closed group only sampling to open group
- CEC is working with HERS Registries to ensure compliance with current sampling process



Proposed Changes

Established Installer Designation

- PV installers that meet the NSHP criteria may submit a request to the CEC to become an NSHP established installer.
- May submit the Established Installer Lease/PPA Form (preview on next slide)
- May submit an attestation for each site in lieu of the installer verification form for projects approved under Guidebook 10 (preview later in presentation)
- The Energy Commission reserves the right to revoke this designation



NSHP Established Installer Reservation Form

New Solar Homes Partnership

1. Lease or PPA Affidavit (Not Applicable for Purchased Systems)

Affidavit ensuring the inclusion of specific program requirements in the Legally Executed Lease or Power Purchase Agreement for the purpose of consumer protection in accordance with program goals.

The system(s) is/are financed under a: Lease Agreement Power Purchase Agreement

2. Declaration

By signing this affidavit, _____ ("Payee"), with respect to the solar electric system project ("system") at _____ (Project Name), for which funding by the New Solar Homes Partnership (NSHP) program is being sought under Application Number _____ (Project ID), certifies and declares under penalty of perjury under the laws of the State of California that each of the statements in the paragraphs below will be legally and contractually included or referenced in the lease or power purchase agreement for all applicable sites within the system.

- The initial term of the agreement is at least ten years.
- At the end of the initial term, the lessee or end-use customer must be provided with the option to have the system removed from their home at the cost of the lessor or system owner. Any other options at the end of the term must be clearly described.
- If the agreement is terminated and the system is removed from the home within the first ten years of the agreement, the Energy Commission may require the repayment of some or all of the NSHP incentive. The lessor or system owner will be responsible for the repayment to the Energy Commission.
- The amount of the NSHP incentive, as determined by the California Energy Commission, and the amount by which the NSHP incentive will reduce the payment made by the lessee or end-use customer under the agreement.

Please attach a list of specific site addresses that are covered by this attestation.



Proposed Changes

Incentive Disclosure Requirement

- Requires all projects where payee is not the end user to complete the Incentive Disclosure Affidavit
- Eliminates need for NSHP Rebate amount to be listed in Lease/PPA
- Preview new form on next slide



NSHP Incentive Disclosure Affidavit

New Solar Homes Partnership

1. Affidavit

Affidavit Ensuring a Realized Incentive Benefit to the End-Use Customer When Payee is the Installer, Equipment Seller, or Third-Party System Owner for the Purpose of Upholding Program Goals.

2. Declaration

By signing this affidavit, _____ ("Payee"), with respect to all solar electric systems within _____ (Project Name), for which funding by the New Solar Homes Partnership (NSHP) program is being sought under Application Number _____ (Project ID), certifies and declares under penalty of perjury under the laws of the State of California that each of the statements in the paragraphs below are complete, true and correct for all sites within the project.

- 1) The Payee agrees that the final NSHP incentive amount, as determined by the California Energy Commission, shall be used to reduce either:
 - a. The costs legally incurred by the end user for the purchase and installation of the solar energy system, when the system has been purchased by the end user, or;
 - b. The lease payments or power purchase payments when the system is owned by a third party.
- 2) The Payee shall inform the end user in writing of the full amount of the final NSHP incentive, as determined by the California Energy Commission.
- 3) The Payee agrees that the California Energy Commission reserves the right to request further documentation that demonstrates that the incentive benefits will be passed to the end-user as provided in this affidavit.



Proposed Changes

Affordable Housing/Disadvantaged Community Projects

- Removes the requirement for tax-exempt status
- Enables affordable housing common area project eligibility for the affordable housing residential incentive rate as long as 80% or more of the residential units are considered affordable
- Introduces an additional incentive for eligible affordable housing projects located in Disadvantaged Communities



Proposed Changes

General Program Changes

- Revises requirements for lease agreements
- Increases the correction period from 10 business days to 15 business days
- Discontinues the additional west-facing incentive
- Discontinues the partial payment incentive process
- Applicability of changes to existing reservations
- Revises NSHP-1, NSHP-2 and NSHP-3 forms



Notable Changes to the NSHP-1 Form

3. Additional Project Information

Accessory Structures (all applicants)

- 1. Does the project contain additional buildings on the lot (guesthouse, cabana, etc.)? Yes, ___ buildings No
- 2. (If yes to previous): Do any of these buildings contain conditioned space? Yes, ___ buildings No
- 3. (If yes to previous): Are any of these buildings on the same utility meter as the main residence? Yes, ___ buildings No

Please initial the following:

I certify that the information entered above is correct: _____

I recognize that each building noted in #3 above must meet all NSHP energy efficiency requirements: _____

Permit Dates (For Small Project applicants only):

Anticipated or actual solar permit application date: _____

Anticipated or actual Certificate of Occupancy date: _____

Please initial the following:

I certify that, to the best of my knowledge, the above dates are correct: _____

I recognize that the my project will be ineligible if the solar permit is applied for more than 60 days after the issuance of the Certificate of Occupancy: _____

4. Solar Energy Systems Information

The system will be: Self-Installed* Installed by licensed contractor**

* For self-installed systems, provide either an equipment purchase agreement, or receipts/invoices showing at least 10% of the price or \$1000 has been paid.

** For systems installed by a contractor, provide a copy of the installation contract.

System #1 Estimated NSHP Incentive (Attach Flexible Installation Calculator) _____

(If applicable) System #2 _____ System #3 _____ System #4 _____ System #5 _____

Declaration and Acknowledgements (all projects)

Please initial the following:

I acknowledge that the NSHP incentive listed above is an estimate, and that the final specifications of the installed system will determine the final incentive.

Applicant's Initials: _____

I acknowledge that in order to be eligible for NSHP incentives, the system components must be listed on the eligible equipment list, found at http://www.gosolarcalifornia.ca.gov/links/equipment_links.php.

Applicant's Initials: _____



Notable Changes to the NSHP-2 Form

- Applicant/Authorized representative declares under penalty of perjury dates for issuance of occupancy permit and solar permit

2. System Details

Sales Arrangement: Purchased Leased PPA

Occupancy Permit Date: _____ Solar Permit Application Date: _____ Solar Permit Issue Date: _____

I certify that, to the best of my knowledge, the above dates are correct: _____



Notable Changes to the NSHP-3 Form

- Final system cost information for each system is now provided on the NSHP-3. This eliminates the need to collect a final invoice/change order
- Additional sites may be submitted on a separate document (i.e. Excel spreadsheet) for large developments

4. Additional System Warranty and Final Cost Information (For Large Projects)

The warranty information on page 1 of this form applies to the following systems in the same project with similar equipment descriptions located at:

1) _____ Warranty Effective Date: _____

Equipment Cost:	Install Cost:	B.O.S.:	Total Cost: =
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Applicability of Changes to Projects with Existing Reservations

- Changes affecting all projects

Category	Change
Incentive Levels	Step 8 is the last incentive
Energy Efficiency	Removes 30% space cooling requirement for 2013 Tier II projects
Energy Efficiency	2013 high-rise multifamily projects to have CF-1R signed by a nonresidential CEA (any new documents)
Energy Efficiency	Code-compliant projects can submit CF-3Rs in lieu of COO
Eligibility	Solar permit can be issued up to 120 days after COO issuance
General	Revised lease requirements
General	Incentive disclosure affidavit
General	Corrections period increased to 15 business days
Established Installers	Can submit lease/PPA summary in lieu of full agreement



Applicability of Changes to Projects with Existing Reservations

- Available on “first come, first serve” basis

Category	Change
Affordable Housing	Qualifying residential unit projects receive the affordable housing rate regardless of the owner’s tax status
Affordable Housing	Qualifying common areas receive the affordable housing rate
Affordable Housing	Bonus for projects located in disadvantaged communities



Applicability of Changes to Projects with Existing Reservations

- Projects that elect to be subject to Guidebook 10 **OR** any site permitted under the 2016 Standards

Category	Change
Incentive Calculation	FI Calculator
Eligibility	Systems must be oriented between 90 and 280 degrees
HERS PV Verifications	Increased sample group size and open group sampling allowed
Established Installers	Can submit attestation in lieu of the NSHP PV-2



FI Calculator Demo

- FI form previews on following slides



NSHP FI-1: Replacement for NSHP PV-1

NSHP Flexible Installation Certificate of Compliance

NSHP FI-1

Test Run

Calculation Name

12/20/2016

Calculation Date

10:50:20 AM

Time



95814

Zip Code

12

Climate Zone

Sep-16

Equipment Library

Number of Sites:

0

Inverters Per Site with: Identical

1

Design Details

Calculation Type:

Single Family, Market Rate, Residential

Efficiency Level:

2016, Code-Compliant

PV SYSTEM INFORMATION

Inverter Manufacturer and Model:

Example Inverter

Module Manufacturer and Model:

Example Module

Array #1 Module Quantity:

2

Array #2 Module Quantity

3

Array #3 Module Quantity

5

Total System Modules:

10

Initial Eligible System Size:

2.70

kW AC Receiving Incentives:

2.00

SHADING

Array #	Minimally Shaded?	Annual Solar Access
1	Yes	100%
2	Yes	100%
3	No	75%

CALCULATION RESULTS

Incentive Level	Incentive Rate (\$/watt)	Per Site Incentive	Project Incentive
5	\$1.25	\$2,500	N/A
6	\$1.00	\$2,000	#N/A
7	\$0.75	\$1,500	#N/A
8	\$0.50	\$1,000	#N/A



NSHP FI-1 for VNM Projects

Building Energy Efficiency Standards: 2016 Number of Sites: 1

RESIDENTIAL SYSTEM DETAILS - AFFORDABLE HOUSING

Percentage of Overall Allocations: 0.0% Energy Efficiency Level: N/A

Initial Eligible System Size: 0.00 kW AC Receiving Incentives: 0.00

Number of Dwelling Units with Income Restrictions Served by System: 0

Total Number of Dwelling Units Served by System: 0

Incentive Level	Incentive Rate (\$/watt)	Per Site Incentive	Project Incentive
6	\$0.00	\$0	\$0
7	\$0.00	\$0	\$0
8	\$0.00	\$0	\$0

RESIDENTIAL SYSTEM DETAILS - MARKET RATE

Percentage of Overall Allocations: 0.0% Energy Efficiency Level: N/A

Initial Eligible System Size: 0.00 kW AC Receiving Incentives: 0.00

Incentive Level	Incentive Rate (\$/watt)	Per Site Incentive	Project Incentive
6	\$0.00	\$0	\$0
7	\$0.00	\$0	\$0
8	\$0.00	\$0	\$0

COMMON AREA SYSTEM DETAILS

Incentive Type: Market Rate Energy Efficiency Level: Code-Compliant

Initial Eligible System Size: 27.80 kW AC Receiving Incentives: 26.69

Percentage of Overall Project Allocations: #####

Incentive Level	Incentive Rate (\$/watt)	Per Site Incentive	Project Incentive
6	\$1.00	\$26,692	\$26,692
7	\$0.75	\$20,019	\$20,019
8	\$0.50	\$13,346	\$13,346



CALIFORNIA ENERGY COMMISSION

NSHP FI-1 for VNM Projects

MODULE BREAKDOWN BY ALLOCATION

Residential - Affordable Housing: 0 Residential - Market Rate: 0

Common Area: 154



EQUIPMENT DETAILS

#	Inverter Manufacturer and Model	Total	Module Manufacturer and Model	Total	Per Inverter Details									
					Array 1		Array 2		Array 3		Array 4		Array 5	
					Qty	Access	Qty	Access	Qty	Access	Qty	Access	Qty	Access
1	Advanced Solar Photonics PV240 (277V)	1	Aavid Thermalloy ASMP-180M	15	1	100%	2	100%	3	100%	4	100%	5	100%
2														
3														
4														
5														
6														
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19														
20														

SUMMARY

Total Initial Eligible System Size: 27.80
 Total kW AC Receiving Incentives: 26.69



NSHP FI-2 and FI-3: Replacements for NSHP PV-2 and PV-3

Equipment Type	CEC Certified Manufacturer Name and Model Number	Pass/Fail
Meter Must be built into inverter or		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Inverter Must be the same as listed		<input type="checkbox"/> Pass <input type="checkbox"/> Fail
PV Modules Must be the same as listed		<input type="checkbox"/> Pass <input type="checkbox"/> Fail

PV Modules		Shading	
Array	Quantity	Minimally Shaded ^{2,1}	Annual Solar Access ²
#1			
#2			
#3			
Total			

Field Measurements for Performance Verification

Measurement	Method Used	Value Measured	Pass/Fail
Ambient Temperature (°F)			<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Solar Irradiance, Array #1 (W/m ²)			<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Solar Irradiance, Array #2 (W/m ²)			<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Solar Irradiance, Array #3 (W/m ²)			<input type="checkbox"/> Pass <input type="checkbox"/> Fail

Performance Verification

Line	Measurement	Method Used	Value	Pass/Fail
#1	Array #1 Expected Output from Field Verification Table (FVT) #1 (W) ³			Line #5 ≥ Line #4 <input type="checkbox"/> Pass <input type="checkbox"/> Fail
#2	Array #2 Expected Output from Field Verification Table (FVT) #2 (W) ⁴			
#3	Array #3 Expected Output from Field Verification Table (FVT) #3 (W) ⁵			
#4	Total Expected Output (W)	Sum of Lines #1, #2, #3		
#5	Electric production (W) as shown on the inverter or performance meter display			



NSHP FI-2 and FI-3 for VNM Projects

PV Modules		Shading	
Array	Quantity	Minimally Shaded? ¹	Annual Solar Access ²
#1			
#2			
#3			
#4			
#5			
Total			

Field Measurements for Performance Verification

Measurement	Method Used	Value Measured	Pass/Fail
Ambient Temperature (°F)			<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Solar Irradiance, Array #1 (W/m ²)			<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Solar Irradiance, Array #2 (W/m ²)			<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Solar Irradiance, Array #3 (W/m ²)			<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Solar Irradiance, Array #4 (W/m ²)			<input type="checkbox"/> Pass <input type="checkbox"/> Fail
Solar Irradiance, Array #5 (W/m ²)			<input type="checkbox"/> Pass <input type="checkbox"/> Fail

Performance Verification

Line	Measurement	Method Used	Value	Pass/Fail
#1	Array #1 Expected Output from Field Verification Table (FVT) #1 (kW) ³			
#2	Array #2 Expected Output from Field Verification Table (FVT) #2 (kW) ⁴			
#3	Array #3 Expected Output from Field Verification Table (FVT) #3 (kW) ⁵			
#4	Array #3 Expected Output from Field Verification Table (FVT) #4 (kW) ⁵			
#5	Array #3 Expected Output from Field Verification Table (FVT) #5 (kW) ⁷			
#6	Total Expected Output (kW)	Sum of Lines #1-#5		
#7	Electric production (kW) as shown on the inverter or performance meter display			



NSHP FI-2E – Replacement for NSHP PV-2 for Established Installers

By signing this affidavit, _____ (Installer), with respect to the solar electric system project ("System") at _____ (site address), which is partially funded by the New Solar Homes Partnership (NSHP) program under Application Number _____ (Project ID), certifies and declares under penalty of perjury under the laws of the State of California that each of the statements in the paragraphs below are complete, true, and correct.

- 1) I have requested and received the designation of "Established Installer" from the NSHP administration.
- 2) I certify that I or my agents have visually inspected the system and the following are true:
 - a. The installed system components have been accurately reported or noted on all NSHP payment claim documents, including the NSHP FI-1.
 - b. The system is installed within the allowed range of azimuth for the Flexible Installation criteria as defined in the NSHP Guidebook, Tenth Edition.
 - c. The system meets the minimal shading criteria as defined in the NSHP Guidebook, Tenth Edition.
- 3) I certify that I or my agents have performed safety tests on the system, including (but not limited to) the following:
 - a. Ground continuity
 - b. Polarity
 - c. Combiner Box
 - d. Open circuit voltage
 - e. Insulation resistance
- 4) I attest that the system will perform to a minimum production level at least equal to the expected instantaneous performance determined by the Field Verification Table (FVT), generated by the FI Calculator.
If the system does not attain the minimum production level, I or my agents shall service the system so that it meets or exceeds the minimum production level.
- 5) This system is part of a NSHP sample group that is verified by a third party HERS Rater and the tested site address is _____.
- 6) A copy of this attestation shall be furnished to the homeowner or end-user of the system. The California Energy Commission may request proof of this.

By signing this attestation, I certify that I am authorized to sign this Affidavit on behalf of the Installer. I also declare under penalty of perjury, under the laws of the State of California, that all of the foregoing statements are true and correct.



Agenda

~~9:00 Welcome & Housekeeping~~

~~9:15 Proposed changes to the NSHP Guidebook~~

10:00 Break

10:15 Public Comment



Agenda

~~9:00 — Welcome & Housekeeping~~

~~9:15 — Proposed changes to the NSHP Guidebook~~

~~10:00 — Break~~

10:15 Public Comment



Questions/Comments?

- Please limit your questions/comments to 3 minutes each.



Submit Comments

- Please submit comments to the Energy Commission's E-commenting online system by **5:00 pm on January 20, 2017**
 - **Visit** <http://www.energy.ca.gov/e-filing/>
- OR**
- **Mail** to: California Energy Commission
Dockets Office, MS-4
Re: Docket No. 16-NSHP-01
1516 Ninth Street
Sacramento, CA 95814-5512



Thank you for participating!

Contact information:

NSHP Program Lead: Elizabeth Hutchison

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FI Calculator: Joseph Omoletski

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Today's agenda and PowerPoint presentation will be available online at:

<http://www.gosolarcalifornia.ca.gov/nshp/training/>